

Appln. No. Serial No. 09/654,436

Amdt. Dated 10/25/04

First Response in Appln, Reply to Office Action of 5/24/2004

Page 3 of 12

### AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

#### Listing of Claims:

1.-7. (Cancelled).

8. (Currently amended)     ~~The time stamping system of claim 1,~~ A time stamping system, comprising a client device and a server device;  
the client device including:  
a digest generation unit for generating a plurality of digests for a plurality of digital documents;  
a digest combining unit for combining the plurality of digests generated by the digest generation unit;  
a unified digest generation unit for generating a unified digest from the plurality of digests as combined by the digest combining unit;  
a transmission unit for transmitting a time stamping request containing the unified digest generated by the unified digest generation unit, to the server device; and  
a reception unit for receiving a time stamp token for the plurality of digital documents from the server device; and  
the server device including, wherein the server device includes:  
a plurality of time acquisition units, each time acquisition unit sequentially acquiring the time information given in a prescribed constant incremental time unit, in response to the time stamping request, independently from other time acquisition units;  
a plurality of combining units, provided in correspondence to the plurality of time acquisition units, each combining unit generating a plurality of time stamped digital documents by sequentially combining a data containing the unified digest with the time

Appln. No. Serial No. 09/654,436

Amdt. Dated 10/25/04

First Response in Appln, Reply to Office Action of 5/24/2004

Page 4 of 12

information sequentially acquired by a corresponding one of the time acquisition units, independently from other combining units;

a plurality of digital signature units, provided in correspondence to the plurality of combining units, each digital signature unit generating a digital signature for each time stamped digital document generated by a corresponding one of the combining units, independently from other digital signature units;

a unified digital signature generation unit for selecting a plurality of digital signatures, one digital signature per each of the digital signature ~~unit~~ units, which are generated by the plurality of digital signature units for one time stamped digital document of an identical time, from a plurality of digital signatures generated by the plurality of digital signature units, and generating a unified digital signature from the selected digital signatures; and

a time stamp token generation unit for generating the time stamp token from said one time stamped digital document and the unified digital signature generated by the unified digital signature generation unit.

9. (Original) The time stamping system of claim 8, wherein each digital signature unit is controlled not to generate the digital signature for at least one of those time stamped digital documents of times that have no chance of becoming the identical time.

10. (Original) The time stamping system of claim 8, wherein the unified digital signature generation unit and the time stamp token generation unit constitute a time stamping authority, while each set of a time acquisition unit, a combining unit, and a digital signature unit constitute a distributed partial time stamping authority.

11.-16. (Cancelled).

Appln. No. Serial No. 09/654,436

Amdt. Dated 10/25/04

First Response in Appln, Reply to Office Action of 5/24/2004

Page 5 of 12

17. (Currently amended) A server device of a time stamping system, the server device comprising:

a plurality of time acquisition units, each time acquisition unit sequentially acquiring the time information given in a prescribed constant incremental time unit, in response to a received digital document, independently from other time acquisition units;

a plurality of combining units, provided in correspondence to the plurality of time acquisition units, each combining unit generating a plurality of time stamped digital documents by sequentially combining the received digital document with the time information sequentially acquired by a corresponding one of the time acquisition units, independently from other combining units;

a plurality of digital signature units, provided in correspondence to the plurality of combining units, each digital signature unit generating a digital signature for each time stamped digital document generated by a corresponding one of the combining units, independently from other digital signature units;

a unified digital signature generation unit for selecting a plurality of digital signatures, one digital signature per each of the digital signature ~~unit~~ units, which are generated by the plurality of digital signature units for one time stamped digital document of an identical time, from a plurality of digital signatures generated by the plurality of digital signature units, and generating a unified digital signature from the selected digital signatures; and

a time stamp token generation unit for generating a the time stamp token from said one time stamped digital document and the unified digital signature generated by the unified digital signature generation unit.

18. (Original) The server device of claim 17, wherein each digital signature unit is controlled not to generate the digital signature for at least one of those time stamped digital documents of times that have no chance of becoming the identical time.

Appln. No. Serial No. 09/654,436

Amdt. Dated 10/25/04

First Response in Appln, Reply to Office Action of 5/24/2004

Page 6 of 12

19. (Original) The server device of claim 17, wherein the unified digital signature generation unit and the time stamp token generation unit constitute a time stamping authority, while each set of a time acquisition unit, a combining unit, and a digital signature unit constitute a distributed partial time stamping authority.

20.-25. (Cancelled).

26. (Currently amended) A time stamping method in a time stamping system formed by a client device and a server device, comprising the steps of:

(a) generating a plurality of digests for a plurality of digital documents at the client device;

(b) combining the plurality of digests generated by the step (a), at the client device;

(c) generating a unified digest from the plurality of digests as combined by the step (b), at the client device;

(d) transmitting a time stamping request containing the unified digest generated by the step (c), from the client device to the server device;

~~The method of claim 20, wherein the step (e) comprises the sub-steps of:~~

~~(e1 e) in response to the time stamping request sent from the client device,~~  
sequentially acquiring the time information given in a prescribed constant incremental time unit, ~~in response to the time stamping request,~~ at each one of a plurality of time acquisition units in the server device, independently from other time acquisition units;

~~(e2 f) generating a plurality of time stamped digital documents at each one of a~~  
plurality of combining units, provided in correspondence to the plurality of time acquisition units in the server device, by sequentially combining a data containing the unified digest with the time information sequentially acquired by a corresponding one of the time acquisition units, independently from other combining units;

~~(e3 g) generating a digital signature at each one of a plurality of digital signature~~  
units, provided in correspondence to the plurality of combining units in the server device, for

Appln. No. Serial No. 09/654,436

Amtdt. Dated 10/25/04

First Response in Appln, Reply to Office Action of 5/24/2004

Page 7 of 12

each time stamped digital document generated by a corresponding one of the combining units, independently from other digital signature units;

(e4 h) selecting a plurality of digital signatures, one digital signature per each of the digital signature unit units, which are generated by the plurality of digital signature units for one time stamped digital document of an identical time, from a plurality of digital signatures generated by the plurality of digital signature units, and generating a unified digital signature from the selected digital signatures, at the server device; and

(e5 i) generating ~~the~~ a time stamp token from said one time stamped digital document and the unified digital signature generated by the step (e4 h);

(i) transmitting the time stamp token from the server device to the client device; and

(k) receiving the time stamp token for the plurality of digital documents from the server device, at the client device.

27. (Currently amended) The method of claim 26, wherein at the step (e3 g), each digital signature unit is controlled not to generate the digital signature for at least one of those time stamped digital documents of times that have no chance of becoming the identical time.

28.-33. (Cancelled).

34. (Currently amended) A method of providing a time stamping service at a server device of a time stamping system, the method comprising the steps of:

(a) sequentially acquiring a time information given in a prescribed constant incremental time unit, in response to a received digital document, at each one of a plurality of time acquisition units in the server device, independently from other time acquisition units;

(b) generating a plurality of time stamped digital documents at each one of a plurality of combining units, provided in correspondence to the plurality of time acquisition units in the server device, by sequentially combining the received digital document with the time

Appln. No. Serial No. 09/654,436

Amndt. Dated 10/25/04

First Response in Appln, Reply to Office Action of 5/24/2004

Page 8 of 12

information sequentially acquired by a corresponding one of the time acquisition units, independently from other combining units;

(c) generating a digital signature at each one of a plurality of digital signature units, provided in correspondence to the plurality of combining units in the server device, for each time stamped digital document generated by a corresponding one of the combining units, independently from other digital signature units;

(d) selecting a plurality of digital signatures, one digital signature per each of the digital signature ~~unit~~ units, which are generated by the plurality of digital signature units for one time stamped digital document of an identical time, from a plurality of digital signatures generated by the plurality of digital signature units, and generating a unified digital signature from the selected digital signatures; and

(e) generating ~~the~~ a time stamp token from said one time stamped digital document and the unified digital signature generated by the step (d).

35. (Original) The method of claim 34, wherein at the step (c), each digital signature unit is controlled not to generate the digital signature for at least one of those time stamped digital documents of times that have no chance of becoming the identical time.

36. (Cancelled).

37. (Currently amended) A computer usable medium having computer readable program codes embodied therein for causing at least one computer to function as a server device of a time stamping system, the computer readable program codes including:

a first computer readable program code for causing said at least one computer to realize a plurality of time acquisition units, each time acquisition unit sequentially acquiring the time information given in a prescribed constant incremental time unit, in response to a received digital document, independently from other time acquisition units;

Appl. No. Serial No. 09/654,436

Amdt. Dated 10/25/04

First Response in Appln, Reply to Office Action of 5/24/2004

Page 9 of 12

a second computer readable program code for causing said at least one computer to realize a plurality of combining units, provided in correspondence to the plurality of time acquisition units, each combining unit generating a plurality of time stamped digital documents by sequentially combining the received digital document with the time information sequentially acquired by a corresponding one of the time acquisition units, independently from other combining units;

a third computer readable program code for causing said at least one computer to realize a plurality of digital signature units, provided in correspondence to the plurality of combining units, each digital signature unit generating a digital signature for each time stamped digital document generated by a corresponding one of the combining units, independently from other digital signature units;

a fourth computer readable program code for causing said at least one computer to select a plurality of digital signatures, one digital signature per each of the digital signature ~~unit~~ units, which are generated by the plurality of digital signature units for one time stamped digital document of an identical time, from a plurality of digital signatures generated by the plurality of digital signature units, and to generate a unified digital signature from the selected digital signatures; and

a fifth computer readable program code for causing said at least one computer to generate ~~the~~ a time stamp token from said one time stamped digital document and the unified digital signature generated by the fourth computer readable program code.